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ABSTRACT

The guidelines provide a statement of principles from the professions of speech-language pathology and audiology which takes into account changes in state programs and the rapid and expanding technology of the hearing aid industry. The first section provides guidelines for the purchase of services for the individual with a communication disorder in the following areas: referral of individuals with communication disorders; assessment and eligibility; delivery of services (qualifications of personnel, supervision, consultation, quality assurance, standards); physical facilities, equipment, and calibration; program procedures (interdisciplinary coordination and reporting/recordkeeping); and prosthetic systems for individuals with communication disorders. The next section gives definitions of 13 key terms (such as assessment, communication disorder, and identification). Guidelines for the selection of augmentative communication systems cover planning for an effective and efficient system; eligibility; service delivery (identification, assessment, communication needs, facilities, program procedures, communication prostheses, funding). Seven additional definitions are provided. Guidelines for assistive listening systems consider hardwire systems, FM auditory systems, alerting devices, telephone assistive devices. The final section contains guidelines for the selection and purchase of hearing aids with suggestions for preselection evaluation, selection, fitting, and the purchasing plan. Also briefly noted are implantable prostheses. (DB)

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GUIDELINES FOR PURCHASE OF SERVICES AND ASSISTIVE DEVICES FOR INDIVIDUALS WITH COMMUNICATION DISORDERS

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CRIPPLED CHILDREN'S DIVISION
THE OREGON HEALTH SCIENCES UNIVERSITY

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INTRODUCTION

During 1971, an Institute on Services for the Hearing Handicapped Child was held at the University of Maryland. This institute generated guidelines for the purchase of speech and hearing services and hearing aids for children. It was financed by a grant from the Division of Maternal and Child Health, of the former Department of Health, Education and Welfare. The project director was Hayes A. Newby, director of Speech and Hearing Sciences, University of Maryland.

The purpose for the revision of the guidelines was to obtain from the profession of speech-language pathology and audiology a statement of principles, necessitated by changes in state programs and the rapid and expanding technology of the hearing aid industry. With the passage of the Education of All Handicapped Children's Act of 1975 (P.L. 94-142), school districts became actively engaged in the purchase of professional services in speech-language pathology and audiology and in the provision of hearing aids for hearing-impaired children. Agencies responsible for the administration of Medicaid programs were concerned about the purchase of professional services, resulting in an increased interest in the establishment of new guidelines. In the intervening years, directors of speech and hearing programs in state health and welfare agencies discussed at their annual meetings the need for the revision and expansion of these guidelines.

In January 1985, the University Affiliated Program of the Oregon Health Sciences University, upon the request of David Macfarlane, M.D., acting director of the Oregon Crippled Children's Division, received funds to expand and revise the guidelines from the Division of Maternal and Child Health, Bureau of Health Care Delivery and Assistance, Health Resources and Services Administration, Public Health Service, U.S. Department of Health and Human Services. Norton B. Young, Ph.D., was named as project director and Duane Anderson, Ed.D., as project coordinator. A working group was invited to Portland, Oregon to develop the initial draft of the guidelines revision. We owe a debt of gratitude to the following individuals who devoted much effort and talent to the project:

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State directors of speech and hearing programs in state health and welfare agencies met in October 1985, in Chicago to examine the document and to make suggestions for change. The final document is a compilation of the suggestions that were presented during this meeting.

Numerous individuals indicated during the Chicago meeting that the guidelines apply equally well for adults as for children and agreed that agencies providing professional services and appliances to the adult population should be able to utilize the information contained herein.

We wish to thank Aaron Favors, John Schwab and James Papai of the Division of Maternal and Child Health for their support and encouragement during the process of this revision.

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GUIDELINES FOR THE PURCHASE OF SERVICES FOR THE INDIVIDUAL WITH A COMMUNICATION DISORDER

REFERRAL OF INDIVIDUALS WITH COMMUNICATION DISORDERS

Speech-language pathology and audiology services should be available to all eligible individuals with known or suspected communication disorders through a multiple-entry delivery system; this should permit referral from all sources and at all points of care including self-referral.

ASSESSMENT AND ELIGIBILITY

The nature and extent of communication disorders and resultant treatment plans should be determined by the provider in consultation with other health care professionals, as appropriate. Likewise, the nature and extent of other health needs, including medical needs, should be determined by appropriate health care professionals. Financial eligibility should be determined by the purchaser of speech-language and hearing services.

DELIVERY OF SERVICES

Qualifications of Personnel

All personnel providing or supervising speech-language pathology or audiology services must be certified appropriately and/or licensed in accordance with the definitions listed in this brochure.

Supervision

There must be on-site supervision in those instances where a provider utilizes noncertified or nonlicensed supportive personnel. Supervision must be carried out by certified and/or licensed speech-language pathologists or audiologists.

Consultation

Consultation with, or referral to, other health care disciplines should be utilized, as required, to ensure that there is a full and adequate assessment and management of the individual with communication disorders, e.g., psychology, medicine or social work.

Quality Assurance

The purchaser, in consultation with a qualified speech-language pathologist or audiologist, should develop policies and procedures for those financial arrangements involving the delivery of service.

The purchaser should have the services of a qualified speech-language pathologist or audiologist for program review and monitoring. The professional may be a full-time staff member of the agency (purchaser), or may participate as a part-time consultant or member of an advisory board.

Purchase arrangements for speech and language pathology or audiology services may involve identification, assessment and management services, and may range from fees charged for specific tests or procedures through contractual agreements for total program services.

Assessment and management for the individual with a communication disorder should include a statement by the provider relative to progress, prognosis and continued plan of management.

Standards

Provider agencies should, where possible, utilize programs and services that hold accreditation from national organizations. These organizations require that programs meet certain minimal standards for qualification of personnel; physical facilities, equipment and calibration; program procedures; and records management. This certification assures the provider agency that quality services are being used.

PHYSICAL FACILITIES, EQUIPMENT AND CALIBRATION

Physical facilities used for provision of speech, language and hearing services shall comply with current local, state and federal standards for the physically disabled. The test environment for audiometric assessment shall conform to the current standard for maximum permissible noise in audiometric test rooms as promulgated by the American National Standards Institute (ANSI).

Audiometers, aural acoustic-immittance instruments and instruments for electrophysiologic assessment shall conform to specifications outlined in current ANSI standards. Calibration of all instruments shall be in accordance with procedures described in these standards, and evidence of calibration shall be displayed near each instrument. All electroacoustic and electromedical equipment that will contact an individual during operation shall conform to established safety limits for electromedical apparatus.

PROGRAM PROCEDURES

Interdiscipline Coordination

Services in speech-language pathology and audiology are but one component of an individual's habilitation or rehabilitation. When other services are to be provided, such services should be included as a part of the total plan for the individual. A case manager should assume responsibility for ensuring implementation of the plan and informing the purchaser of all additional services, as needed.

Reporting and Records

Details of service (whether identification, assessment or management) need to be documented and recorded to ensure continuity of treatment. This record-keeping function may follow the agency's policies or the program may wish to apply for accreditation from national organizations

such as the American Speech-Language-Hearing Association or the Commission on Accreditation of Rehabilitation Facilities, which specify standards for record keeping and reporting.

Follow-up evaluations are essential to the continuation of care and are to be performed by qualified speech-language and hearing professionals at regular intervals.

PROSTHETIC SYSTEMS FOR INDIVIDUALS WITH COMMUNICATION DISORDERS

Determination of benefits and potential risks of personal hearing aids, assistive listening systems and augmentative communication systems shall be a responsibility of the speech, language and hearing professional along with the selection and recommendation of appropriate prostheses. Guidelines for selection, recommendation, fitting and purchase of these three classes of prosthetic systems are provided in the sections that follow. The selection and purchase of a prosthetic system does not constitute a complete program of management, but is an integral part of the habilitation/rehabilitation program. The provider shall be responsible for ensuring that post-selection services are provided.

DEFINITIONS

Assessment: Procedures used to determine the nature and extent of the communication disorder, as carried out by the speech-language pathologist or audiologist.

Audiologist: A professional who specializes in the identification and prevention of hearing problems and in the nonmedical habilitation/rehabilitation of those who have hearing problems. An audiologist holds a master's or doctoral degree in audiology, a certificate of clinical competence in audiology from the American Speech-Language-Hearing Association (ASHA) and/or state licensure in audiology, where appropriate.

Case Manager: The designated professional who assumes overall responsibility for the individual's habilitative/rehabilitative program.

Communication Disorder: Any disorder of hearing, speech, language or voice.

Hearing Aid Dispenser: An individual who sells personal hearing aids to consumers. A license or registration to dispense personal hearing aids is required in a majority of states.

Hearing Aid Wholesaler: A company that purchases hearing aids from manufacturers for resale to retailers.

Identification: A screening or case-finding procedure used to detect individuals with speech, language and hearing or voice disorders.

Management: Assured implementation of the rehabilitative and habilitative procedures used by the speech-language pathologist or audiologist.

Otolaryngologist: A physician who specializes in diseases of the ear, nose and throat. This individual is licensed to practice medicine within a state and may be board certified in the specialty.

Otologist: A physician who specializes in diseases of the ear. This individual is licensed to practice medicine within a state and may be board certified in the specialty.

Provider of Speech, Language and Hearing Services: Any agency, facility, center or clinic that provides services to communicatively impaired individuals; has staff who hold appropriate certification by the ASHA, or who are licensed appropriately by the state in which they practice; and ensures that the provision and management of services to communicatively impaired individuals is conducted by certified or licensed personnel. A provider may be an independent practitioner who meets the certification and license requirements referred to above.

Speech, Language and Hearing Services: All procedures used by speech-language pathologists and audiologists in the identification, assessment and management of individuals with communication disorders.

Speech-Language Pathologist: A professional who holds a master's or doctoral degree specializing in the identification, prevention or treatment of speech, language and voice disorders. The speech-language pathologist holds a certificate of clinical competence in speech-language pathology from the ASHA and/or state licensure in speech-language pathology when appropriate.

GUIDELINES FOR THE SELECTION OF AUGMENTATIVE COMMUNICATION SYSTEMS

PLANNING FOR AN EFFECTIVE AND EFFICIENT AUGMENTATIVE COMMUNICATION SYSTEM

Provision of an augmentative communication system for an individual must be an integral part of, and coordinated with, an overall plan of service. This plan will identify candidates and assess the physical, intellectual, linguistic, sensory and communication needs of the individual. Both short- and long-term management plans need to be developed. Planning should include:

- determination of specific procedures for regulating the purchase of services and of equipment related to communication management,

- determination of the available and accessible facilities that provide for appropriate assessment and management,
- identification of all state laws that may regulate the selection and sale of augmentative communication systems,
- identification of private and public funding sources,
- establishment of a monitoring mechanism to ensure cost containment and accountability,
- identification of advocates to promote the access and continuity of these services and
- maintenance of equipment.

ELIGIBILITY

All persons should have an opportunity to receive an augmentative communication system to enhance communicative, educational, social and vocational functioning. Further, provision of such a system should be at the earliest possible age. Standards and methods for determination of eligibility shall comply with the rights of individuals under the United States Constitution, Social Security Act of 1935, the Civil Rights Act of 1964, the Rehabilitation Act of 1973 and the Education for All Handicapped Children Act of 1975 (P.L. 94-142) and its amendments. Continuous review of future and relevant legislation will be necessary to ensure compliance.

DELIVERY OF SERVICE

Identification

Early identification is important to the long-term planning and implementation of a functional communication system for the individual whose nonspeaking condition may persist throughout life. Augmentative communication systems assist in reducing frustration arising from communication failure and help establish an improved self-image. For the person whose speech is nonfunctional at the time of assessment, but may improve, the implementation of an augmentative communication system may also serve to reduce frustration and actually facilitate speech and language growth.

Augmentative communication systems are also appropriate for persons with a temporary loss of speech caused by medical and surgical intervention. Examples of such interventions include intubation, tracheotomy, laryngectomy and glossectomy.

Assessment

Assessment of the following parameters should be conducted in order to select an optimal augmentative communication system for the individual:

Physical

- optimal control of postural tone,
- optimal seating and/or positioning,
- utilization of most versatile motor skill for operating an augmentative system,

- optimal positioning and stabilization of augmentative communication device,
- adequate determination of oral motor speech status including prognosis for improved or deteriorated functioning and
- portability of augmentative communication system.

Intellectual
- continuing appraisal of the individual's cognitive status and
- determination of learning style (e.g., behavior, activity level).

Linguistic
- determination of language comprehension,
- determination of expressive language,
- determination of appropriate symbol set or system,
- determination of the individual's use of pragmatics in communication and
- assessment of communicative intent.

Sensory
- determination of visual status,
- determination of auditory status and
- determination of tactile/kinesthetic status.

Communication needs
- Determination of need for augmentative communication system to enhance conversation, writing and signaling emergency, basic care and related needs.

Environments where individual resides, attends school, works and socializes
- training of support staff who will instruct the individual in the use of the augmentative communication system and
- training of primary caregivers.

Communication Needs
Included in the management of communication needs are:
- training prerequisite skills,
- provision of appropriate speech therapy,
- training strategies to improve attending behavior,
- training strategies to enhance the use of the augmentative communication system for interaction,
- training the significant support individuals who interact with the augmentative communication users,
- management for augmentative communication systems (an ongoing process requiring continuous review and assessment). Management requires a multidisciplinary approach. It is recommended that one individual from the professional team be responsible for the overall management.

Facilities

The facility that is assessing and making recommendations needs to have, or have access to, the variety of materials and equipment necessary to adequately select appropriate systems and devices. These materials and equipment shall include:

- a selection of switches and other interfaces (e.g., joysticks),
- a number of communication board displays containing a variety of symbol sets and systems for demonstration,
- various indicators (e.g., pointers: hand-held or head-mounted) and
- hardware including dedicated microprocessor-based devices, general-purpose computers and electronic noncomputerized equipment.

Program Procedures

Interdisciplinary Coordination

- Depending upon the particular needs of the client, the interdisciplinary evaluation team may include any or all of the following: the client, speech-language pathologist, audiologist, physical therapist, occupational therapist, educator, physician, psychologist, seating and fitting specialist, engineer, social worker, vocational counselor, vendors, extended family, friends and primary caregivers.

- The unique needs of the severely impaired, nonspeaking individual dictate the use of strategies not typically followed in the management of communication disorders.

Records and Reports

Records should include specific information regarding:

- milestones of speech and language development or recovery,
- feeding development and current status,
- communication frustration level,
- response to previous speech and language treatment,
- trial use and response to augmentative communication systems and devices and
- caregivers' and teachers' assessment of the device's value.

Communication Prostheses

Communicative Training Devices

Examples include:

- timers and relays,
- battery-operated toys and
- loudness-level indicator.

Speech Enhancers

Examples include:

- artificial larynges,
- amplifiers,
- vibrotactile speech units (e.g., Fonator) and
- oral speech prostheses (obturators).

Expressive Communication Devices
Examples include:
- electronic and nonelectronic communication devices,
- dedicated microprocessor-based communication aids and
- general-purpose computer using dedicated communication software.

Funding

Locating the funds to pay for recommended equipment and services needs shall be the responsibility of the interdisciplinary team. The funding of equipment falls generally within several areas:
- private—family provided,
- private—donation (e.g., service organization, funds secured through sponsorship of an event),
- private—insurance,
- public—e.g., Medicaid, Medicare, Crippled Children's Services, Vocational Rehabilitation,
- public—education agency and
- combination of above.

DEFINITIONS AND TERMINOLOGY

Aided Communication Methods: All techniques in which some type of physical object or device is used. These include techniques that use communication boards, charts and mechanical or electrical aids.

Augmentative Communication System: The total functional communication system of an individual including a communicative technique, a symbol set or system and communication/interaction behavior.

Communication/Interaction Behavior: Those behaviors necessary to have an idea received and understood. Examples may include demanding, requesting, giving and getting information, expressing feelings, ideas and beliefs and participating in conversation.

Communication Methods: Unaided and aided means to transmit ideas.

Nonspeaking Persons: Any person for whom speech is temporarily or permanently inadequate to meet all of his or her communication needs, and whose inability to speak is not due primarily to a hearing impairment or hearing-impaired individuals with additional developmental disabilities.

Symbol Set or System: The means to represent ideas and concepts. These systems may include spoken words, pictures, Blis symbolics, Rebus symbols, traditional orthography (written) and sign language.

Unaided Communication Methods: All techniques that do not require any physical aids such as manual, gestural, manual/visual, sign or facial communication as well as oral speaking.

GUIDELINES FOR THE SELECTION OF ASSISTIVE LISTENING SYSTEMS

ASSISTIVE LISTENING SYSTEMS

Assistive listening systems are devices designed to solve one or more specific listening problems created by hearing loss not always solved by the use of a personal hearing aid. In some instances, assistive listening devices are used in conjunction with personal hearing aids for specific listening conditions. Assistive listening systems can be grouped into the following six categories:

Hardwire Systems

- **Personal Amplifying Device**: A hand-held microphone that amplifies to a transducer worn in the ear.
- **Direct Audio Input**: Use of a personal hearing aid with auxiliary sources such as a tape deck, external microphone or FM auditory system.
- **Induction Loop Systems**: A cable encircling a room that enables a listener with a telephone switch on a hearing aid to receive a signal from a transmitting source.

FM Auditory Systems

Frequency-modulated transmitting system worn for personal use or for classroom auditory training of hearing-impaired children. This system may be used as the primary amplication mode or used in conjunction with a personal hearing aid.

Infrared

A system that transmits infrared light waves to receiving headsets used in auditoriums and in homes for television listening.

Alerting Devices

A visual or tactile device that signals an event, i.e. buzzer or light.

Telephone Assistive Devices

- **TTY/TDD**: A device that transmits a typewritten or encoded message via the telephone from one TTY/TDD to another.
- **Telephone Amplifiers**: A device that amplifies telephone conversation for hearing-impaired listeners.
- **Hearing aids** with telephone coil.

Telecaption Decoder

A device that transforms television dialogue into printed words.

DELIVERY SYSTEM

Although assistive listening devices are used to aid the hearing impaired, they are not classified as hearing aids; the delivery system is not controlled

by either state or federal regulations as is the case with hearing aids.

The optimal use of assistive listening devices will require the services of a qualified audiologist for selection, adjustment, training and follow-up. These devices can be obtained through manufacturers, distributors and retail outlets. Similar funding resources can be utilized for acquisition of the devices as specified in the purchase plan for hearing aids.

GUIDELINES FOR THE SELECTION AND PURCHASE OF HEARING AIDS

AN OVERVIEW OF PERSONAL HEARING AIDS

Personal hearing prostheses can be classified under the general subheadings of personal hearing aids and implantable prostheses. Although the distinction between a personal hearing aid and an assistive listening device is not clear in some cases, these guidelines focus upon the more traditional categories of air-conduction hearing aids and vibrotactile (bone conduction) hearing aids. In general, an air conduction hearing aid delivers the amplified sound to an individual's external ear canal. Vibrotactile hearing aids deliver the amplified sound to the bones of an individual's head or body. Nonelectronic wearable hearing aids also must be considered. The category of implantable prostheses currently includes cochlear implants, middle ear implants and bone-anchored hearing aids.

Certain generalizations apply to the selection, recommendation, fitting and purchase of all wearable prostheses and to many of the assistive listening systems as well:

- To be most effective, the provision of a personal hearing aid must be coordinated into an overall program of device orientation and aural rehabilitation.
- A body of federal and state regulations apply to the dispensing and sale of hearing aids and to the implantation of prostheses.
- Public and private agencies may provide resources to help with the purchase of personal hearing prostheses.
- Provider agencies should utilize the services of certified and/or licensed audiologists in their hearing aid acquisition or provision programs in order to ensure optimal client benefit.

SELECTION, RECOMMENDATION, FITTING AND PURCHASE OF PERSONAL HEARING AIDS

Preselection Evaluation

Prior to making recommendations concerning the fitting and delivery of a hearing aid to an individual, the status of the hearing sensitivity shall be evaluated. The complexity of the audiologic assessment will be dependent upon the age and functioning level of the individual.

The audiologic assessment of individuals with hearing impairment may include:

- assessment of intelligibility for speech,
- determination of tolerance and comfortable loudness levels for amplification,
- evaluation of hearing sensitivity for pure tones and
- assessment of middle ear function.

The individual shall receive a medical examination and medical clearance for hearing aid use, preferably by a physician specializing in diseases of the ear.

Selection

Introductory counseling for the hearing-impaired individual shall include:

- a discussion of realistic expectations for hearing aid use including advantages and disadvantages of personal hearing aids,
- types of hearing aids available and
- structure and function of the hearing aid.

A determination of the use of air-conduction vs. vibrotactile hearing aids for the individual shall be conducted by the provider.

A decision on the fitting of one or both ears with hearing aids will be determined by the provider.

The type of hearing aid to be considered will include:

- body style,
- behind-the-ear,
- eyeglass,
- in-the-ear or canal (not recommended for children under 10 years of age unless documentation indicates inadequacy of other options) and
- special hearing aids for delivering sound from one side of the head to the opposite side; e.g., contralateral routing of signals (CROS) hearing aid.

Considerations for options such as a telephone switch, noise suppressor, tone control, etc., and interaction of the hearing aid with assistive listening systems shall be the responsibility of the provider.

An evaluation of the demonstrated benefit of the hearing aid shall be performed. This may include:

- objective measurements performed by the provider,
- a trial-use period for the hearing-impaired individual to assess the degree of improvement in hearing performance with a personal hearing aid and
- special testing.

Recommendations

Based on the described selection procedures and patient satisfaction and desires, a recommendation shall be made for a specific hearing aid or aids.

Fitting

Essential to the successful use of amplification include:

- an orientation by the provider to hearing aid operation, insurance options, warranty, manufacturer and dispenser service and maintenance,
- an electro-acoustic analysis of the hearing aid in comparison to manufacturer specifications,
- an earmold or in-the-ear shell modifications and fitting,
- an electronic and acoustic modifications of the hearing aid and earmold and
- a follow-up schedule of future audiologic evaluation, habilitative or rehabilitative services and local resource for minor maintenance of hearing aid and acquisition of batteries.

Purchasing Plan

The purchasing plan shall provide personal hearing aids and related services of appropriate quality at a reasonable cost with minimum delay. Hearing aids may be purchased under four basic plans:

A negotiated contract may be established with vendors of personal hearing aids. A contact by phone, letter or a visit by a representative of the vendor can establish a dollar amount per unit in which a purchase is anticipated. Although the aids are purchased in small quantities, the unit cost can be based on an anticipated number of purchases over a predetermined period of time. Example types of vendors who sell in this manner include:

- hearing aid dispensers,
- hearing aid wholesalers,
- manufacturers and
- dispensing audiologists.

Purchasing can occur directly from a manufacturer using a wholesale price list. Again, manufacturers are able to give their multiple purchase price if the purchaser anticipates that a number of units will be purchased over a predetermined period of time.

Competitive bidding may be an option where an agency can specify the approximate number of units they anticipate purchasing and can specify the various manufacturers' products that are to be purchased. This usually is within a specified time period of one year. The bidding process ordinarily is carried out under the same rules regarding policies in which other prosthetic or capital goods are purchased. The competitive bid system can be utilized with:

- hearing aid dispensers,
- hearing aid wholesalers,
- manufacturers and
- dispensing audiologists.

Several state agencies may wish to combine to form a buying co-op in order to receive higher discounts based on volume for hearing aids obtained directly from the manufacturers.

In addition to the above methods of purchasing, agencies shall consider the cost-saving potential for realizing a substantial reduction from the manufacturer's published wholesale price by purchasing discontinued, used or prior year's instruments. With the purchasing options available, it is not usually necessary to purchase a personal hearing aid at the retail price.

IMPLANTABLE PROSTHESES

Implantable prostheses, by definition, require a surgical procedure. In consequence, decisions related to selection, recommendations and fitting of these systems are made by a team that includes a surgeon who specializes in diseases of the ear (an otologist). Since the variety and number of implantable prostheses are increasing dramatically each year, guidelines must be general.

Evaluation of the safety and efficiency of any implantable hearing prosthesis is controlled by a division of the Food and Drug Administration (FDA). A prosthesis usually is classified initially as an experimental device. Next, it may be classified as an investigational device and implanted by selected teams of investigators before being released by the FDA for general use. The status of a given device will dictate the tests and procedures required before and after implantation.

Cochlear Implants

A cochlear implant is not an amplification device like a hearing aid. A cochlear implant system is designed to electrically stimulate the nerve cells remaining in the inner ear of a patient who is profoundly deaf. These systems may require surgical insertion of an electrode into an individual's inner ear (cochlea). Alternatively, an electrode may be placed on the membranous surface of a window that opens into the inner ear space (the round window). Decisions regarding the type of cochlear implant recommended will depend upon the age of the individual, the type of disease that produced the deafness and the individual's performance on a battery of tests. As a general rule, however, a cochlear implant will not be recommended for an individual who can benefit from the personal hearing aids described in the preceding section.

Bone-Anchored Hearing Aids and Middle Ear Implants

Bone-anchored hearing aids and middle ear implants are most useful for individuals with good inner ear functions and with middle ear disorders that cannot be corrected effectively by traditional reconstructive surgery of the middle ear. As with cochlear implants, the surgeon will be guided by current FDA regulations as decisions are made regarding selection, recommendations, implantation and purchase of the prostheses.

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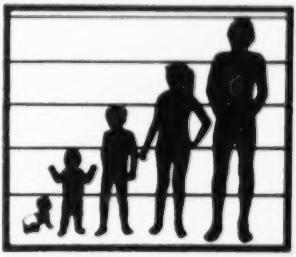

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